
Description

Equipping Meridian 1 switches with Feature Group D (FGD) allows the network owner to operate as an Inter-Exchange Carrier (IEC), subject to Local Exchange Carrier (LEC) regulations. The result is that off-network sources can gain access to corporate networks. A typical Feature Group D (FGD) configuration is shown in [Figure 1](#). In this case, the corporate network contains Meridian 1 switches.

Local network and end office switching

A *calling customer* is the Local Exchange Carrier (LEC) customer that requests an end-to-end connection (originating call). A *called customer* is the LEC customer with whom the calling customer wants to speak (terminating access call).

The LEC for FGD has two levels.

- The end office is where the calling customer lines are connected.
- The access tandem is where the switching system (any switch that provides FGD features) distributes traffic among the end offices that use the tandem within the Local Access and Transport Area (LATA).

An end office can access FGD directly or through an access tandem. Services provided for direct and tandem access are the same; calling customer differences are not noted.

Originating features

A calling customer can place only domestic calls. A domestic call originates and terminates within World Zone 1 (WZ1).

Note: Currently, a calling customer may not dial outside the North American Dialing Plan. Certain locations outside the continental United States, but still within World Zone 1 (WZ1), may require international dialing and are not supported under the domestic dialing plan. For example, the Caribbean is within WZ1 but requires international dialing capabilities. Therefore, the calling customer in this particular location cannot access the Caribbean.

Domestic dialing plan

Use the following sequence for domestic calls through FGD.

(10XXX) + (0/1) + 7/10D

Legend:

() Parentheses	Indicates that the numbers within the parentheses may not be required for dialing.
/ Slash	Indicates that either one or the other may be used.
10XXX	Designates that the call be handled by the IEC network.
0	Requests Northern Telecom Dial 0 services.
1	May be required for some 7-or 10-digit calls. For example, a 1 may indicate 10-digit dialing.
7/10D	Represents the 7 or 10 digit directory number for the called customer.

Presubscription

A presubscription Incoming Call (IEC) is the IEC that the calling customer selects to route domestic calls without a 10XXX designator. By dialing the 10XXX code, you can override this presubscribed IEC.

Service Access Code

Service Access Codes (SACs) are Number Plan Area (NPA) codes assigned for special use. Normally NPA codes are used to identify specific geographical areas. However, some NPA codes within the North American Numbering Plan (NANP) are designated as SAC codes to indicate generic services or access capability.

Currently four NPA codes are designated as SAC codes; each is associated with a specific service or access capability:

- 610 SAC is assigned to Canada for TWX service.
- 700 SAC is reserved for the IEC.
- 800 SAC is assigned for toll-free numbers.
- 900 SAC is reserved for special services such as pay-subscription.

SACs also provide the option to assign access capability to the LEC and IEC network. SACs further divide into categories that define the IEC identification requirements.

Ancillary Carrier Identification (10-digit translation)

Access this category by dialing (1) + SAC-NXX-XXXX. Do not enter the 10XXX access code. The full 10 digits are translated to determine the IEC.

Embodied Carrier Identification (6-digit translation)

Access this category by dialing (1) + SAC-NXX-XXXX. Do not enter the 10XXX access code. The 6 digits (SAC-NXX) are translated to determine the IEC.

External Carrier identification

Access this category by dialing (10XXX) + (0/1) + SAC-NXX-XXXX. The IEC is determined by the 10XXX access code. If the 10XXX is not dialed, the presubscribed IEC routes the call.

Automatic Number Identification (ANI)

For billing and screening purposes, the IEC can have ANI digits precede the called party address. The ANI includes two information digits, followed by the calling customer's area code and billing number. If the billing number is not available, the information digits are followed by the area code only.

Signaling protocol

FGD can use the following signaling protocols for originating (LEC to IEC) calls:

- Exchange Access North American (EANA) signaling
- Terminating protocol—for test calls only

Carrier test lines

The only test lines supported by Feature Group D (FGD) are those supported by the Meridian 1 system. For a complete description of the carrier test lines, refer to *Transmission testing capabilities description and operation* (553-2001-325).

Outpulsing

Exchange access signaling is implemented with overlap signaling or outpulsing.

Terminating features

Only test calls are supported for outgoing FGD calls.

LEC test lines

The following types of test lines may be provided by the LEC:

- balance (100 type)
- nonsynchronous or synchronous
- automatic transmission
- data transmission (107 type)
- measuring (105 type)
- loop around
- short circuit
- open circuit

Interface protocol

Direction

Trunks are characterized according to the direction that supervisory and address signals are applied.

- A one-way outgoing trunk from the LEC carries the originating calls.

Note: One-way outgoing trunks, from the LEC to the IEC, do not provide IEC test capability.

- A one-way incoming trunk to the LEC carries terminating calls.
- A two-way trunk carries both originating and terminating calls.

Signaling protocol

The supported signaling protocols are terminating protocol (for outbound test lines only) and Exchange Access North American (EANA) signaling.

Terminating protocol

In addition to the originating signaling protocol, there is one terminating protocol for line tests as follows:

- 1** The IEC seizes a trunk to the LEC and applies a connect (off-hook) signal to the trunk.
- 2** The LEC responds with a wink-start signal, which informs the IEC that the LEC is ready to receive the address field.
- 3** On receipt of this wink-start signal from the LEC, the IEC will multifrequency (MF) outpulse the address field.
- 4** The LEC screens and translates the address field. If the terminating call is delivered to the appropriate end office, the LEC completes the call to the proper called test line. An IEC may have to establish more than one Point of Termination (POT) to obtain access to an entire LATA.
- 5** When the called customer answers, answer supervision (off hook) is passed to the IEC from the LEC. The time that the off-hook signal is received by the LEC is recorded by Automatic Message Accounting (AMA) as the customer answer time.
- 6** When the call is over, the disconnect sequence is initiated. The time that the on-hook signal is received is recorded by AMA as the disconnect time.

Exchange Access North American (EANA) signaling

Exchange Access North American (EANA) signaling consists of two fields, the identification field and the address field.

- The **identification field** contains the calling customer's identification number or ANI digits.
- The **address field** contains the called number.

This arrangement allows the identification field (ANI digits) to be pulsed to the IEC before the called number. With the addition of overlap pulsing, which initiates pulsing to the IEC before the customer has completed dialing, post-dialing delay is minimized. The originating call process follows:

- 1 After the customer dials all but the last four digits of the called number, the LEC initiates actions to seize a trunk to the IEC.
- 2 The IEC responds to the trunk seizure with a wink-start signal when ready to receive pulsing. The time that the wink-start signal is received is recorded by Automatic Message Accounting (AMA) as the IEC connect time.
- 3 After receiving the wink-start signal from the IEC, the LEC starts MF outputting the identification field.
- 4 When both customer dialing and outputting of the identification field are completed, the LEC outputs the address field.
- 5 When the IEC receives all the pulsing information, it responds with an acknowledgment wink.
- 6 After receiving the acknowledgment wink, the LEC connects the talking path from the calling customer to the IEC.
- 7 After the called customer answers, the answer off-hook signal is sent from the IEC to the originating LEC. The time that the off-hook signal is received is recorded by AMA as the customer answer time.
- 8 When the call is completed, the disconnect sequence is initiated. The time that the on-hook signal is received is recorded by AMA as the disconnect time.

Carrier classification

Inter-Exchange Carrier (IEC) provides connections between Local Access and Transport Areas (LATAs) and serving areas where the calling and called customers are located in World Zone 1.

International Carrier (INC) provides connections between a customer located in the contiguous 48 United States and a customer located outside World Zone 1.

Consolidated Carrier (IEC & INC) combines the services of Inter-Exchange and International Carriers.

When calls are being forwarded to carriers using exchange access signaling, the protocol is influenced by the classification of the receiving carrier. The IEC and IEC & INC receive calls destined for customers located in World Zone 1 with EANA signaling.

Call categories and pulsing formats

Call categories are based on the information dialed by the originating customer. **Table 1** identifies the applicable call categories for FGD switched access service.

Table 1
Call categories

Customer dials	Call category
(10XXX)+(1)+(NPA)+NXX+XXXX - NPA is in area covered by North American Numbering Plan	(Inside WZ 1) 1+
(10XXX)+0+(NPA)+NXX+XXXX - NPA is in area covered by North American Numbering Plan	(Inside WZ 1) 0+
(1)+SAC+NXX+XXXX	1+(Embodied SAC)
(10XXX)+(1)+SAC+NXX+XXXX	1+(External SAC)
(10XXX)+(0)+SAC+NXX+XXXX	0+(External SAC)
95Y+XXXX y = 8 or 9	Test (7 digits)
10X	Test (3 digits)
Legend: () = variable inclusion; whole contents may not be required NPA = area code in North American Numbering plan NXX = end-office code in North American Numbering plan SAC = service access code WZ = World Zone	

Table 2 shows the protocols available for each call category depending on the carrier classification.

Table 2
Interface protocols

Call category	IEC	IEC & INC
(Inside WZ1) 1+	EANA	EANA
(Inside WZ1) 0+	EANA	EANA
10XXX+0	EANA	EANA
1+(Embodied SAC)	EANA	EANA
1+(External SAC)	EANA	EANA
0+(External SAC)	EANA	EANA
Test	EANA	EANA
Legend: IEC = Inter-Exchange Carrier IEC & INC = Consolidated Carrier EANA = Exchange Access North American Signaling OS-1 = Operator Services Signaling - Inside World Zone 1 OS-O = Operator Services Signaling - Outside World Zone 1		

Tables 3 and 4 summarize the pulsing formats by call category for EANA and terminating protocols, respectively.

Table 3
Access North American signaling

Call category	Identification field	Address field
(Inside WZ 1) 1+	KP+(II+3/10D)+ST	KP+(NPA)+NXX+XXXX+ST
(Inside WZ 1) 0+	KP+(II+3/10D)+ST	KP+0+(NPA)+NXX+XXXX+ST
10XXX+0	KP+(II+3/10D)+ST	KP+0+ST
1+(Embodied SAC)	KP+(II+3/10D)+ST	KP+SAC+NXX+XXXX+ST
0+(External SAC)	KP+(II+3/10D)+ST	KP+0+SAC+NXX+XXXX+ST
Test (7D)	none	KP+95Y+XXXX+ST
Test (3D)	none	KP+10X+ST
Legend: II = 2-digit code for ANI information 3/10D = 3 or 10 digit Y = 8 or 9 3D = 3 digits 7D = 7 digits		

Table 4
Terminating protocols

Call category	Address field
IEC calls to directory numbers within LATA	KP+(NPA)+NXX+XXXX+ST
IEC calls to Directory Assistance Service (555+1212)	KP+(NPA)+555+1212+ST
IEC calls to LEC Test Lines (see note)	KP+95Y+XXXX+ST - Y=8 or 9 or KP+10X+ST
Note: End-office codes other than 95Y can be used with LEC test lines in some areas.	

EANA protocol specifications

LEC-to-carrier pulsing

The format restrictions on the pulsing combinations for calls in the (Inside WZ 1) 1+ and (Inside WZ 1) 0+ categories are as follows:

Identification field	Address field
KP+(11+3/10D)+ST	KP+(0)+7/10D+ST

The format restrictions on the pulsing combinations are as follows:

- The first digit in the identification field after KP is never 1.
- The start pulse at the end of the identification sequence is not primed.
- The 7/10 D in the address field conforms with the NANP.

Variations

When ANI is provided, the structure of the identification field is KP+(II+3/10D)+ST. The variations in the field are Information digits (II).

Table 5 is the default table that shows the digit pair default assignments.

Table 5
Information digits (II)

Information digits	Explanation
00	Regular line
01	4- and 8-party
06	Hotel/Motel
07	Coinless
10	Test call
12–19	Cannot be assigned because of conflicts with 1NX used as first digits in international calls
20	Automatic Identification of Outward Dialing (AIOD) listed directory number sent
27	Coin
95	Test Call

Alternative arrangements

The carrier may elect to receive ANI or not to receive ANI.

The ANI digits are the full 10-digit billing number, including the Number Plan Area (NPA), except when the calling line's billing number cannot be identified. When the calling line's billing number cannot be obtained, a 3-digit NPA, associated with the originating end office, is sent.

Without ANI, the basic format of the pulsing stream received by the carrier is as follows:

— KP+ST+KP+(0)+7/10D+ST

The identification field without ANI is reduced to KP+ST. By eliminating ANI, the two information digits (II) are also eliminated.

Time limits

Wink-start—The IEC returns the wink-start signal within 3.5 seconds (Carrier Switch Time [CSWT]) of the trunk seizure.

Wink-start guard—The end of the wink-start signal must not occur before 210 ms (CSWT) after receipt of the incoming seizure signal. The IEC must be prepared to receive MF pulses 35 ms after the end of the wink-start signal. The IEC waits for 50 ms (Bell Operating Company Switch Time [BSWT]) after the end of the wink-start signal before initiating MF pulsing.

Acknowledgment wink—The IEC responds with the acknowledgment wink between 200 ms (CSWT) and 3.5 seconds (CSWT) after receipt of the complete address field. The IEC should not attempt to use the talking path for communication with the calling customer before returning the acknowledgment wink.

Answer—The IEC provides an on-hook state continuing for at least 250 ms (CSWT) between the acknowledgment wink and the steady off-hook signal indicating called party answer.

EANA protocol example

Tables 6 and 7 show examples of several originating calls using Exchange Access North American (EANA) signaling protocol.

Table 6

EANA protocol: customer dials a World Zone 1 number

Situation		
Customer dials (10990)+(1)+815+NXX+XXXX		
Trunk group uses Exchange Access North American signaling protocol		
Interface interactions		
LEC	POT	Meridian 1
Customer dials all but last 4 digits		
Seize	----->----- -----<-----	Wink
Identification field KP+00+212+555+XXXX+ST	----->-----	
Customer finishes dialing		
Address field KP+815+NXX+XXXX+ST	----->----- -----<-----	Acknowledgment wink
LEC connects talking path		
Disconnect	-----<----- ----->----- -----<-----	Answer Disconnect
Interpretation		
Class of service of calling line is Regular (II=00).		
Billing number of calling line is 212+555+XXXX.		
Dial 0 calling service is not requested (1+call).		
Called number is 815+NXX+XXXX.		

Terminating protocol example

Table 7 shows an example of a call to an LEC test line using the FGD terminating protocol.

Table 7
Terminating protocol: carrier call to an LEC test line

Situation Carrier's craftsperson to connect to an LEC test line Trunk group uses terminating signaling protocol		
Interface interactions		
Meridian 1	POT	LEC
Seize	----->-----	
	-----<-----	Wink
Address field		
KP+95Y+XXXX+ST	----->-----	
	-----<-----	Answer
Test		
Disconnect	----->-----	
	-----<-----	Disconnect
Interpretation Requests connection of incoming trunk to test line 95Y+XXXX, where Y=8 or 9. Carriers should note that office codes other than 95Y can be used with LEC test lines in some areas.		

Hardware

This section describes the Meridian 1 hardware requirements for FGD.

Trunks

Trunk hardware must support EAM, EM4, or Loop Dial Repeating (LDR) line signaling, including digital channels.

MF signaling

FGD trunks need MF tone receiving hardware for incoming calls and MF tone sending hardware for outgoing calls.

MF tone receiving is provided by a new QPC916 MF Receiving Card (MFRC). MF tone sending is provided by the existing MF loop or by the Meridian 1 Conference/Tone and Digit Switch (TDS) card.

MF senders

For the non-Meridian 1 environment, the existing MF loop provides MF sending capability. In a Meridian 1 environment, the MF sending capability of the Conference/TDS card is used. The generic abbreviation MFS is used throughout this document to denote both kinds of senders.

The Meridian 1 feature provides support for Conference/TDS and MF loop coexistence and coordinated operation:

- Both MF loops and Conference/TDS loops are eligible when MF sending is needed for an outgoing trunk. (This was needed for Central Automatic Message Accounting [CAMA] and Controlled Class of Service Allowed [CCSA] type trunks only prior to the present feature.)
- Both MF loops and Conference/TDS loops can serve Meridian 1 or non-Meridian 1 trunks or both.
- The MF sending services provided by the Meridian 1 feature are used for terminating calls on FGD trunks. Only terminating test calls are supported.

MF receivers

An MF Receiver Card (MFRC) such as the QPC916 is used to service incoming calls on all current FGD trunks.

General description

Each MFRC contains two independent MF receivers that use digital signal processing technology. The card can be plugged into any standard EPE shelf.

Table 8 provides the MF receiver (MFR) specifications.

Table 8
MFR specifications (Part 1 of 3)

Parameter	Limits	Conditions
1 General: — # of receivers — coding	2 U-Law	
2 Input frequencies (HZ)	700 900 1100 1300 1500 1700	Unless otherwise noted. hi tone: -7 dbm lo tone: -7 dbm Freq: nominal Noise: -25 dbm, white Signal duration: 50 ms Pause duration: 50 ms
3 Frequency discrimination: — must accept	+/- (1.5% + 5Hz)	Noise: -30 dbm
4 Input level: — must accept — must reject	0 to -25 dbm per tone below -35 dbm per tone	

Table 8
MFR specifications (Part 2 of 3)

Parameter	Limits	Conditions
5 Signal duration: — must accept — must reject — must accept (KP) — may accept (KP) — must reject (KP)	 >30 ms <10 ms >55 ms >30 ms <10 ms	 All signals except KP KP signal KP signal KP signal
6 Signal interruption — ignore interruption	 <10 ms	 After minimum length signal has been received
7 Time Shift between two frequencies: — must accept Coincidence between the two frequencies: — must reject	 <4 ms <10 ms	
8 Interdigit pause — must accept	 >25 ms	A pause means: signal <-35 dbm
9 Max dialing speed	10 digits per second	
10 Tolerance to twist: — must accept	 <6 dbm	One tone relative to the other tone.
11 Reception in presence of disturbances.		
12 Error rate in presence of white noise	< 1/2500 calls	Nominal freq: -23 dbm/tone On/Off = 50/50 ms Signal to noise ratio = (-20 dbm all digits each call) - (10 digits)

Table 8
MFR specifications (Part 3 of 3)

Parameter	Limits	Conditions
13 Immunity to impulse noise error rate	< 1/2500 calls	Nominal freq: -23 dbm/tone On/Off = 50/50 ms Signal to noise ratio = -12 dbm ATT Digit simulation test tape #291m from pub. 56201 Duration: 1 hour
14 Power lines: — error rate	< 1/2500 calls	60 Hz signal at -9 dbm or 180 Hz signal at -22 dbm
15 Third freq: — must accept in the presence of third freq. if it is	< -28 dbm	Below each frequency
Note: Digit is accepted if there are only two valid frequencies.		

Feature interactions

The following paragraphs describe the interactions between the listed features and Feature Group D only. For a complete explanation of these features, see *X11 features and services* (553-3001-305).

Access restriction

FGD trunks must have answer supervision and disconnect supervision.

Outgoing FGD trunks are supported for testing purposes only.

Incoming FGD trunks have Unrestricted Access (UNR), except that FGD trunks cannot terminate to FR1 tie trunks or FR1 stations because they are, by definition, denied access to and from the exchange network.

Table 9 shows the access summary from FGD trunks for the listed functions.

Table 9
Access summary from FGD trunks (Part 1 of 4)

	Conference, Privacy release, Mixed sets	Hunting, Direct Access	Night Posting, Call Pickup, TAFAS, Call Forward	Attendant extended	Hold, Call Transfer
WATS	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
FX	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
CCSA UNR to SRE	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit

Table 9
Access summary from FGD trunks (Part 2 of 4)

	Conference, Privacy release, Mixed sets	Hunting, Direct Access	Night Posting, Call Pickup, TAFAS, Call Forward	Attendant extended	Hold, Call Transfer
CCSA FRE	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
CCSA FR1	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed
CCSA FR2	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed
DID	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
CO	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
TIE UNR to SRE	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
TIE FRE	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
TIE FR1	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed
TIE FR2	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed

Table 9
Access summary from FGD trunks (Part 3 of 4)

	Conference, Privacy release, Mixed sets	Hunting, Direct Access	Night Posting, Call Pickup, TAFAS, Call Forward	Attendant extended	Hold, Call Transfer
STN UNR to SRE	Access allowed if signaling arrangements permit	No restrictions	No restrictions	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
STN FRE	Access allowed if signaling arrangements permit	No restrictions	No restrictions	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
STN FR1	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed
STN FR2	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed
PAG	Access not allowed	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console	Only consultation- hold allowed
DICT	Access not allowed	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console	Only consultation- hold allowed
RAN	Access not allowed	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console	Only consultation- hold allowed

Table 9
Access summary from FGD trunks (Part 4 of 4)

	Conference, Privacy release, Mixed sets	Hunting, Direct Access	Night Posting, Call Pickup, TAFAS, Call Forward	Attendant extended	Hold, Call Transfer
AIOD	Access not allowed	Access not allowed	Access not allowed	Access not allowed	Access not allowed
CCSA ANI	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit
CAMA	Access allowed if signaling arrangements permit	TGAR restricted only	TGAR restricted only	Access allowed, but call is held on console loop if signaling is not permitted	Access allowed if signaling arrangements permit

When a fully restricted party receives calls through an unrestricted FGD trunk, the restriction still applies. **Table 10** shows that though calling parties have various levels of access (FRE, FR1, and FR2), the restrictions for the FGD trunk apply.

Table 10
Restricted access summary from FGD trunks

Connection type	Allowed or Denied		
	FRE	FR1	FR2
Direct Access	A	D	D
Conference or Transfer	A	D	D
CFO	A	D	D
CFF	A	A	A
Call Forward No Answer	A	D	D
Call Forward Busy	Not applicable		
Hunt	A	D	D
MIX, MULT, Private Line	A	D	D
TAFAS (of W by Z)	A	D	D
Call Pick Up (of W by Z)	A	D	D

Automatic Trunk Maintenance (ATM)

FGD trunks support Automatic Trunk Maintenance (ATM). Automatic test lines are provided by the LEC for T100 and loop lines using a reference and a test trunk. For more information, see LD 92 in the *X11 input/output guide* (553-3001-400).

Note: ATM is not supported on trunks controlled by a D-channel.

Barge-In

Barge-In is not supported on an FGD trunk.

Call Detail Recording (CDR)

The CDR records can contain ANI information. For a complete discussion, see *Call Detail Recording description and formats* (553-2631-100).

Calling Line ID (CLID)

When an FGD call is routed over ISDN Primary Rate Interface (PRI) or Integrated Services Link (ISL), the complete 10-digit ANI number is provided as the CLID. Three-digit ANI numbers are not treated as CLID.

Call Party Disconnect Control (CPDC)

On an incoming FGD route, Call Party Disconnect Control is allowed but not recommended. If CPDC = YES, any disconnect signal received from the LEC is ignored.

This does not apply to test calls.

Call Party Name Display (CPND)

The name defined for the incoming FGD trunk access code is displayed.

Customer Controlled Routing (CCR)

The ANI is used as the CLID when sent to the CCR processor for displaying the calling party number.

Dialed Number Identification Service (DNIS)

To support DNIS on an FGD route, define the route with DNIS = YES and NDGT = 3 or 4. This enables the last three or four digits in the FGD address field to act as the DNIS number. For every incoming FGD call, the DNIS is saved. Normal FGD termination uses NARS to reach an Automatic Call Distribution Directory Number (ACD DN).

In X11 release 19 and later, DNIS information can be displayed on a terminating telephone across call modification. If a DNIS trunk call originates from an FGD trunk and the terminating agent performs call modifications within the same switch, the DNIS number appears on the terminating telephone. This capability applies to both ACD and non-ACD agents, and to such call modifications as Conference, Transfer, Call Park, and Call Park Recall.

In X11 release 19 and later, if the DNIS-CDR option of the incoming FGD trunk's Route Data Block is enabled, the DNIS number is appended to the end of the CDR record.

DNIS, used by many companies to provide customer service tailored to individual needs, has been limited to four digits. This four-digit maximum creates a limit of 10,000 possible codes. It can also prevent customers from using DNIS with paging applications, as paging numbers are five to seven digits long.

The DNIS modification available with X11 release 20 changes the number of supported digits from three or four to one through seven inclusive. To implement this change, customers must set the NDGT prompt in LD 16 to indicate the number of DNIS digits expected (1–7, with a default of 4).

Call Detail Recording (CDR) supports the DNIS number for the FGD trunk. For more information, refer to *Call Detail Recording description and formats* (553-2631-100).

Digit Display

FGD supports Digit Display where allowed.

If more than 16 digits (including delimiters) are displayed, the digits scroll to the left, deleting the left-most digits from the display. The right-most 16 digits remain on the display.

Incoming Digit Conversion (IDC)

Incoming Digit Conversion (IDC) is not supported on FGD trunks.

ISDN PRI and ISL

FGD calls should use ISDN networking capability after a call has reached the network.

Network Alternate Route Selection (NARS)

FGD relies on the NARS feature for call termination. NARS is enhanced by FGD to allow local termination.

Network Call Redirection (NCRD)

If an FGD call is redirected for any reason supported by NCRD, ANI is used for updating the terminating telephone's display.

Malicious Call Trace (MCT)

A field added to the MCT record output contains the identification code (II+ANI) received from the LEC, thus identifying the caller. A second line is added to the MCT printout that lists a header "ANI," the II, and the ANI digits. If no ANI digits are received, an unmodified Malicious Call Trace (MCT) report is printed. An example of the MCT printout is shown below:

```
MCT CUST0      TN 117 3 10 4      *TN 109 3 10 2      15:30:05   12/11/91
ANI  00-2134159661
```

If an incomplete identification field is given, the printout includes all the digits received.

```
MCT CUST0      TN 117 3 10 4      *TN 109 3 10 2      15:30:05   12/11/91
ANI  00-213
```

Minor Alarm

The minor alarm on the attendant console lights up whenever one or more MFR units fails testing.

Private Line Service

FGD trunks should not be defined as Private Lines.

Traffic measurements

See *Traffic measurement formats and output* (553-2001-450) for a complete description of the traffic measurement printouts.

Trunk Group Distinctive Ringing

Trunk Group Distinctive Ringing is supported by FGD trunks when DRNG = YES in the FGD data block.

Trunk Verification from a Station (TVS)

Sets with Trunk Verification from a Station Allowed can access FGD trunks and use the MF capability to dial test numbers of three or seven digits. There is usually no dial tone provided on FGD trunks.

Figure 2
Trunk verification

